Name: Date:

Polynomial Factoring solution (version 676)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 6x + 36 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(1)(36)}}{2(1)}$$

$$x = \frac{-(6) \pm \sqrt{36 - 144}}{2(1)}$$

$$x = \frac{-6 \pm \sqrt{-108}}{2}$$

$$x = \frac{-6 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{-6 \pm 6\sqrt{3}\, i}{2}$$

$$x = -3 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-7 + 9i$ and $5 + 4i$ in standard form $(a + bi)$.**

Solution

$$(-7 + 9i) \cdot (5 + 4i)$$

$$-35 - 28i + 45i + 36i^2$$

$$-35 - 28i + 45i - 36$$

$$-35 - 36 - 28i + 45i$$

$$-71 + 17i$$

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3. **Write function $f(x) = x^3 - 11x^2 + 38x - 40$ in factored form. I'll give you a hint: one factor is $(x - 5)$.**

Solution

	1	-11	38	-40
5		5	-30	40
	1	-6	8	0

$$f(x) = (x-5)(x^2 - 6x + 8)$$

$$f(x) = (x-5)(x-2)(x-4)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+7)^2 \cdot (x+4)^2 \cdot (x+1) \cdot (x-3)$$

Sketch a graph of polynomial $y = p(x)$.